PROCESS ENABLING FINANCIAL TRANSACTIONS, SYSTEM THEREOF AND ELECTRONIC PURSE

The present invention concerns financial transactions between a purchaser or a buyer, at least one seller and at least one financial institute. The invention includes a process enabling financial transactions, a system thereof and an electronic purse being part of said system.

There are several existing systems enabling financial transactions, such as the payment of purchase without cash exchange. One can mention to that end debit or credit cards, and payment cards said "E-CASH".

For the debit or credit cards, the amount of authorised spending is usually limited. This limitation can be by restricting the amount per transaction or by restricting the amount of transactions over a determined period, one day or one month for example, this restriction being decided by the institute which issues the card and/or by a sort of card. This limitation is due to the fact that the issuing institute having issued the card and controlling its use is usually not informed in real time about the spending of the purchaser. This is a drawback of this sort of card in particular for users having a sufficiently supplied account at the issuing institute or bank, and wishing to pay above the determined limit, who cannot access to the whole of their financial resources. A possibility of overcoming this drawback consists in subscribing to many cards for the user in order to use them successively, but it's a disadvantage for the user because he must carry several cards and checks furthermore in order to know the usable cards. On the other hand, many sellers are not interested in this type of card system because the payment for any purchase or service to the seller by the issuing institute of the card is not in real time but differed.

An "E-CASH" payment card recently appeared has to be introduced in a payment device of the bank, like a "BANCOMAT", for being loaded with a selected amount of "electronic money". Later at the time of the purchase, the card is debited of the amount of the purchase, the receiving device of the seller, in which the card has been introduced, being credited with the same amount. The drawback of such system is that it is necessary to go to a bancomat-type device before carrying out payment and that the amount to be charged on the card is limited.

Another drawback of these above-mentioned cards is also that a card of any type can be easily stolen. At the time of its use by a non-authorised person and unless it has been blocked meanwhile, one checking is usually effected either based on a signature or a PIN code, and that this checking can be easily overcome fraudulently.

The process enabling financial transactions relating to a purchase between a buyer and a seller according to the invention allows to overcome the above-mentioned

drawbacks of existing processes, in particular by providing an online communication system between the bank or the issuing institute, the buyer and the seller, thus allowing checking operations as regards user's identity, spending authorisation, debit and credit in real time or almost in real time, this being possible with an electronic purse owned by the purchaser.

Such a process is described in claim 1, a system to implement this process is described in claim 14 and an electronic purse being part of said system is described in claim 16. Any particular embodiments or variants of the process, of the system and of the electronic purse are described in depending claims following from the above-mentioned ones.

The unique figure shows schematically the proposed system and its different components, in particular the electronic purse.

Firstly one has an issuing institute or bank 1 in which one of the users of the system, namely the future buyer, holds one account. This user receives an electronic purse 2 from the institute 1. The product or service seller must have a cashing device 3. The seller is customer of a bank 4. The institute 1 must be equipped with means 10 for transmitting and receiving connecting signals 5, 8 to and from the electronic purse 2 as well as to and from the bank 4. The cashing device 3 can receive and eventually transmits connecting signals 6, 7 from the electronic purse 2 as well as to and from the bank 4.

The electronic purse 2 includes in particular a numeric or alpha-numeric keyboard 20, a screen 21 and an intern electronic circuit 22 coupled with transmitting and receiving means of connecting signals 5 for the institute 1. The connecting signals 5 between the electronic purse 2 and the institute 1 should be of radio-electrical type. Preferably, the connection 5 between the electronic purse 2 and the institute 1 should be made by means of a mobile telephone 23 linked by cable to an appropriate port of the electronic purse and the transmission being made by means of global phone network 50. Being partly made of a keyboard and of a screen according to another embodiment, the electronic purse 2 can be directly integrated into a mobile phone 23 or inversely.

According to another embodiment, the connection 5 between the electronic purse 2 and the institute 1 can also be a direct radio-electrical connection 51 or more generally a connection 52 via a ground relay 53 and the phone network 54 or a connection 55 between the electronic purse 2 and a communication satellite 56 which transmits the signal via a relay 53 or directly to the institute 1. For this type of connection, the electronic purse 2 is equipped with an antenna 24.

In some cases the radio-electrical connection like above-mentioned should not be possible, for instance in underground shop, a connection between the electronic purse 2 and the institute 1 should be possible through some types of connections 6, 7 and 8 described hereafter.

If the user, respectively the buyer, wishes to pay for a product or a service, he firstly establishes the connection 5 of the selected type for his electronic purse or the best type of possible connections in respect of his geographical position, in case the electronic purse is equipped to provide a choice of said above-mentioned connections 5. Preferably, the establishing of a connection 5 starts by the emission of a code which is memorised in the circuit 22 and suitable for each electronic purse 2. So, the institute 1 immediately and exactly identifies the electronic purse 2 which is connecting, and then the user introduces an additional code, a numeric PIN code, by means of the keyboard 20 in order to identify himself. A computer program installed in the electronic purse 2 displays a set of options on the screen 21. Then with the aid of the keyboard, the user chooses to debit the account at his institute 1 for an amount of money corresponding to price of the purchase he wants to pay or for an upper amount of money, and to credit his electronic purse 2 with requested amount in electronic money. The whole of these operations happens by means of the connection 5.

The transaction between the buyer and the seller happens by means of a connection 6 which is established between the electronic purse 2 and the cashing device 3 at the time of the payment. This transaction consists in transferring the amount or part of the amount in electronic money, which has just been downloaded on the electronic purse 2, to the cashing device 3. The connection 6 can be realised in one of the following embodiments. According to the first embodiment as shown under 60, the electronic purse 2 is completed with a chip card 61 having in particular a writable memory. When the card 61 is introduced in an adequate slot of the electronic purse 2, the electronic circuit 22 loads the memory of said card in electronic money for the requested amount of money to carry out the transaction, in similar manner to the one used actually for downloading the E-CASH-type cards. Identification and/or authorisation codes can be simultaneously downloaded.

Then, this card 61 is taken out of the electronic purse 2 and is transmitted to the cashing device 3 where it is introduced into an appropriate slot.

According to a first variant of the process, the card 61 is compatible with the existing card systems, for example in self-service petrol stations or E-CASH payment systems. It can be similarly read and debited. The card 61 can be also compatible with Bancomat-type devices which allow cash withdrawal.

According to a second variant of the process, the identification codes are firstly read by an adequate system 30 within the cashing device 3. Then, the cashing device 3 or the seller connects to the issuing institute or bank 1 in which the buyer has an account. This connection can be established in many ways. Since the seller is part of the system offered by the institute 1, the connection can be directly established between the cashing device 3 and the institute 1. In variant, this connection can be established in two portions, a first portion 7 between the cashing device 3 and the bank 4 from which the seller is a customer, then a second portion 8 between this bank 4 and the institute 1. Since the cashing device 3, the bank 4 and the issuing institute 1 are physically located in defined places, the connections 7 and 8 should be established via the phone network as shown under 70 and 80, or via any other means, for example via the Internet connections.

When the cashing device 3 is connected with the institute 1, it interrogates this latter based on the identification codes read on the card 61, about the debit authorisation of the buyer's account for the amount of money of the transaction. When the authorisation is confirmed, the card 61 is debited with the requested amount for the transaction. This electronic money is then registered by means of the connection 7 to the bank 4 of the seller. The money is definitely transmitted to the bank 4 from the institute 1 either simultaneously or, more generally later, after a routine clearing transaction between the institute 1 and the bank 4.

According to a second embodiment of the connection 6, this one can be of electro-magnetic type as shown under 62, the electronic purse 2 including an emitting circuit and an antenna 24, whereas the cashing device 3 includes a receiving circuit and an antenna. In variant, this connection 62 can be of infra-red or ultra-sound type; the transmitting and receiving devices have to be consequently equipped.

According to a third embodiment, one can have a cable 63 equipped with two connectors which can be linked to two corresponding connectors installed respectively on the electronic purse 2 and the cashing device 3.

The above-described connections 62 and 63 transmit the same type of information than those transmitted by previously described chip card 61 connection. In relation to the transmission 60 via the chip card 61, connections of the type 62 or 63 have the advantage of allowing bi-directional transmission between the electronic purse 2 and the cashing device 3.

According to another variant, the connection 6 can be directly established via the electronic purse 2 if it is equipped with an integrated mobile phone 23.

A very important aspect of this process and system is the security offered at all partners of the transaction, the issuing institute 1, the buyer or owner of the electronic purse 2, and the seller or owner of the cashing device 3 and his bank 4.

Firstly, the transaction is effected without cash exchange, which constitutes a first measure of security. Moreover, since the institute 1 knows in real time the account balance of the electronic purse's owner, it can authorise spending exceeding a fixed amount of the existing systems, as long as the owner's account has a positive balance. On the other hand, since the seller establishes a connection 7, 8 in real time at the time of the payment of the transaction by the buyer, and since he receives the bank's authorisation, the seller is ensured of this payment and can accept this payment with an amount upper than a fixed amount. For a supplementary security, the institute 1 can accept the authorisation only if the owner of the electronic purse 2 has downloaded his electronic purse 2 with an amount corresponding to this one of the transaction or upper, during the same day or in a determined laps of time before his purse is checked by the cashing device 3. Specific precautions must be taken in order to ensure that the carrier of an electronic purse 2 who wishes to effect a purchase is the actual owner whom the institute 1 recognises. As previously mentioned, the carrier of the electronic purse 2 must introduce a numeric PIN code before he can do any transaction. Other means of identification can be imagined, in particular detection means of a parameter suitable for the owner of the electronic purse. Therefore, the electronic purse 2 can be equipped with a highly sensitive zone 25 on which the owner puts the fingerprint of one of his fingers. The fingerprint is read and compared with one fingerprint memorised in a memory circuit of the electronic purse. It is only when a checking circuit has controlled that the fingerprint of the carrier corresponds to the owner's one memorised in the memory circuit that the transaction is authorised. Other parameters can be used in place of numeric fingerprint checking like recognition means, such as for example the signature of the carrier which is put on the sensitive zone 25. It's noted that the above-mentioned recognition means can be applied even if several owners are recognised for a determined electronic purse, for example colleagues of a company sharing the same purse, or members of a family. In this case, the memory circuit contains all fingerprints or all authorised signatures. The PIN code of each authorised user can be different in order to differentiate the users at the institute. When the intern circuit 22 of the electronic purse 2 recognises the introduced parameter, fingerprint, signature or other, it delivers a recognition code which can be distinguished from the mentioned identification code or combined with the identification code, or in another way the identification code can be transmitted only when the carrier has been positively recognised.

Considering these described levels of security, the institute 1 knows that it is really the owner known from a determined electronic purse who is acting. The seller is assured that the payment is without problem because of the receipt he gets from connections 7 and 8. Considering the described identification means, the owner of an electronic purse knows that his purse cannot be used if it is stolen. This system allows to prevent any fraudulent activity between two partners of the system.

This process has been described with the establishing of a connection 5 between the electronic purse 2 and the institute 1 before any transaction. If the user or the owner of the electronic purse 2 plans to effect several purchases in the same day, he can also download determined amount on his electronic purse by establishing a connection 5 with the financial institute 1 at the beginning of the day for example, from any place where such a connection is easily realisable, and successively debit his purse 2 with the requested amounts on several cashing devices 3. An advantage of these proceedings is that only one connection 5 is established to download electronic money on the electronic purse 2, from any place where such a connection is easily realisable. In addition to that, the program menu which is integrated in the electronic purse can advantageously contain a function for restituting the remaining amount in the electronic purse at the end of the day to the institute 1 by establishing a last connection 5. This function can be automatic, i.e. activated for a determined moment of the day, or manual, i.e. activated by the user. There is therefore no advantage to steal an electronic purse which is regularly emptied of its balance of electronic money.

Several functions permit to multiply the market possibilities for the use of electronic purse 2. Advantageously, the program inside the electronic purse 2 enables to effect a transaction in any type of currency; when the user requests for a spending authorisation, he can specify the currency concerned. The transaction is then effected in this currency.

The electronic purse is equipped with a keyboard 20 and a screen 21. It is easy to implement an appropriate circuit to use it as a calculator. In this case, the electronic purse 2 is advantageously equipped with a bar code reader 26. With this, the owner can effect purchases in a supermarket where product prices are indicated by bar codes, allowing to obtain the whole amount of his purchases after he has passed the bar code reader ahead each label equipped with such a code in order to have time to establish a connection 5 to the institute 1 and to obtain the spending authorisation before going to the till, respectively to the cashing device 3. If the electronic purse 2 is equipped with an integrated mobile phone 23, or can be linked to such an apparatus, the user can also effect purchases, respectively payments with TV network or on the internet network.

In variant or complement, the electronic purse 2 can be equipped with a beacon 27 of Argos or GPS or other type, allowing to find an electronic purse which would be stolen or lost. If the electronic purse is stolen or lost, the owner can alert the institute 1 which can empty the purse and/or de-activate it via the connection 5 and launch an inquiry via the beacon 27 in case the electronic purse is equipped with such a beacon. In addition to that, in case a non authorised carrier attempts to effect a purchase with the electronic purse, the seller will be informed of that at the beginning of establishing the connection between the cashing device 3 and the institute 1.

In variant or complement against theft of the electronic purse 2, this one can be completed with a separate remote control 9 by means of which the user can send a signal 90, for example of radio-electric type, to de-activate the electronic purse and eventually control the restitution of the remaining amount. This remote control 9 can be advantageously integrated in a separate mobile phone or in any other current object such as a key ring.